The Secret life of: Soil!

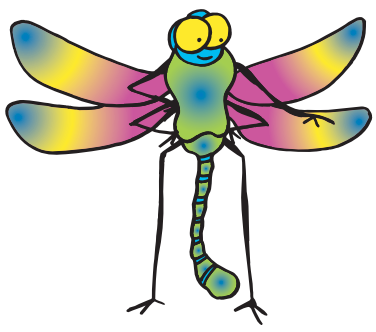
Hi! I'm Lily, the Pacific green tree frog. Our local waterways are home to me and many of my friends.

Some of you may wonder why a frog (who lives in water) cares about soil. The reason is quite simple: plants grown in healthy soil are able to resist disease and bugs and require fewer pesticides and fertilizers. We all know pesticides and fertilizers can harm water quality if they are carried with rainwater into local streams and rivers. So, the less we use, the better our water quality. Clean water is very important to me and my friends!

Vocabulary Word

Microorganisms:

Organisms too small to be seen without the aid of a microscope.



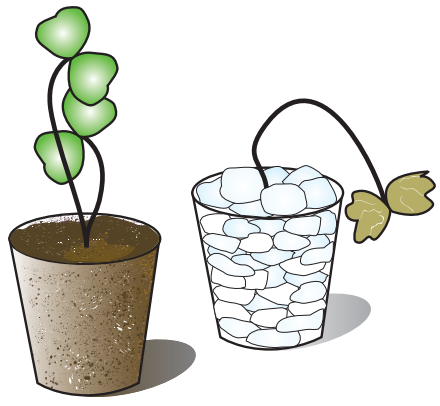
Hello! I'm Dougie the dragonfly, one of Lily's friends. Take this test to find out how much you know about keeping soil healthy.

How often do you really think about soil? We grow food in soil, we play in soil, we get soil on our shoes, and we make mud pies with soil. So, what exactly is soil? Soil is a mixture of ground up rock, decaying plants and animals, air, and water. Soil is an essential part of the earth.

Soil is dead, right? Wrong! Soil is alive with organisms that keep soil healthy and make nutrients that plants use to grow. Many organisms make up this underground living system. Some you can see; some are so small they can only be seen with a microscope. Organisms you *can* see include earthworms, arthropods, and nematodes. What you *can't* see are important microorganisms: fungi, bacteria, and protozoa.

Microorganisms are tiny, natural recyclers. They act as decomposers, breaking down organic material into nutrients that are used by plants. Although they are very small, soil microorganisms keep soil healthy and alive. And, healthy soil makes healthy plants, reducing the need for harmful chemicals to fight bugs and disease.

To prove soil is alive and full of nutrients, try this simple experiment using potting soil, cotton balls, and lima bean seeds.



What happened after the lima beans germinated in the two cups? Why are the lima beans grown in cotton balls not thriving?

You Will Need:

- ✔ Cotton balls
- ✔ Potting soil
- ✔ Lima bean seeds
- ✔ Water
- ✔ Three clear plastic cups
- ✔ Notebook to write observations

Procedure:

1. Fill one plastic cup half way with soil. Place a few seeds on top of the soil leaving a little space between them. Then fill the rest of the cup with soil, covering the seeds.
2. Fill the other plastic cup half way with cotton balls. Randomly place one or more seeds between the cotton balls. Fill the rest of the cup with cotton balls, again covering the seeds.
3. Fill the third plastic cup with water.
4. Carefully pour a small amount of water over the cup containing the soil. Make sure the soil is not soupy, just moist to the touch.
5. Carefully pour a SMALL amount of water over the cup containing the cotton balls and add water a little at a time. The cotton balls should just be moistened, not soaking.
6. Place the cups on a shelf or warm window ledge. (Plants do better if they are able to get some sun.)
7. Water plants carefully as needed when the soil/cotton balls are dry to the touch.
8. Observe the growth of the plants every day and write down what happens. Compare your observations to the information in the box below.

Experiment Results:

The lima beans grown in the soil should be robust and healthy. The small roots that grow into the soil absorb water along with nutrients created by the microorganisms that live in the soil. The lima beans grown on cotton balls will germinate in water, but not survive without nutrients.

Test your knowledge about healthy soil!

Some of the things we do in our yard can harm soil microorganisms, making soil unhealthy. Other things we do will improve soil. Answer these questions to test your knowledge about healthy soils.

Will this activity harm microorganisms in soil?

1. Dumping used motor oil in the garden ☐ Yes ☐ No
2. Recycling old paint ☐ Yes ☐ No
3. Adding compost to soil ☐ Yes ☐ No
4. Pulling weeds by hand ☐ Yes ☐ No
5. Leaving grass clippings on the lawn ☐ Yes ☐ No
6. Using weed and feed on the lawn ☐ Yes ☐ No
7. Using pesticides to kill bugs on roses ☐ Yes ☐ No
8. Rotating vegetable crops in the garden ☐ Yes ☐ No

Answers:
1. Yes. Oil will smother any living organisms in the soil.
2. No. Paint is toxic; never dump it on soil!
3. No. Compost adds nutrients to soil.
4. No. This is much better than using harmful chemicals.
5. No. Grass clipping add nutrients to soil and hold in moisture.
6. Yes. Weed and feed kills good organisms too.
7. Yes. Pesticides kill soil organisms too.
8. No. Rotating crops reduces the need for chemicals.